#### HVAC NOTES:

- . PROVIDE LABOR, MATERIALS, TOOLS, MACHINERY, EQUIPMENT, AND SERVICES NECESSARY TO COMPLETE THE HVAC WORK UNDER THIS CONTRACT. ALL SYSTEMS AND EQUIPMENT SHALL BE COMPLETE IN EVERY ASPECT AND ALL ITEMS OF MATERIAL, EQUIPMENT AND LABOR SHALL BE PROVIDED FOR A FULLY OPERATIONAL SYSTEM AND READY FOR USE. COORDINATE THE WORK WITH THE WORK OF THE OTHER SUBCONTRACTORS IN ORDER TO RESOLVE ALL CONFLICTS WITHOUT IMPEDING THE JOB PROGRESS.
- 2. EXAMINE THE ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL DRAWINGS AND OTHER DIVISIONS, AND SECTIONS OF THE SPECIFICATIONS IN ORDER TO DETERMINE THE EXTENT OF THE WORK REQUIRED TO BE COMPLETED UNDER THIS DIVISION. FAILURE TO EXAMINE ALL THE CONTRACT DOCUMENTS FOR THIS PROJECT WILL NOT RELIEVE THIS CONTRACTOR OF HIS RESPONSIBILITIES TO PERFORM THE WORK REQUIRED FOR A COMPLETE FULLY OPERATIONAL AND SATISFACTORY INSTALLATION.
- 3. THE WORK INCLUDES BUT IS NOT LIMITED TO THE DEPICTED SYSTEMS, EQUIPMENT AND SERVICES, AS SPECIFIED HEREIN.
- 4. START-UP SERVICES SHALL BE INCLUDED.
- 5. ALL SYSTEMS, EQUIPMENT AND SERVICES SPECIFIED HEREIN SHALL BE PROVIDED COMPLETE AND READY FOR USE. ALL EQUIPMENT, DUCTWORK, PIPING, DAMPERS, OUTLETS ARE NEW, FURNISHED AND INSTALLED BY THIS CONTRACTOR, UNLESS OTHERWISE NOTED.
- 6. DUCTWORK AND PIPING ARE SHOWN DIAGRAMMATICALLY AND DO NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ENGINEER. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER SUBCONTRACTORS IS REQUIRED. PROVIDE COORDINATION DRAWINGS SHOWING ALL TRADES WORK AND EXISTING CONDITION.
- . INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES INVOLVING EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- B. VERIFY FINAL LOCATIONS FOR ROUGH WORK WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT BEING CONNECTED.
- PROVIDE A COMPLETE SYSTEM OF VIBRATION ISOLATION FOR EACH ITEM OF HVAC EQUIPMENT AND APPARATUS AS SPECIFIED HEREIN, AS SHOWN ON THE DRAWINGS AND AS NEEDED FOR A COMPLETE AND PROPER INSTALLATION.
- 10. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACE AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER IN THE INTERIOR OR THE EXTERIOR.
- 1. ALL PRESENT MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY NYPL, OR AS NOTED TO BE RELOCATED ON THE DRAWINGS, AND SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR.
- 12. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
- 3. ALL CONTROL WIRING SHALL BE DONE BY MECHANICAL CONTRACTOR, IN ACCORDANCE WITH SEQUENCE OF OPERATION, AS SPECIFIED, AND IN ACCORDANCE WITH MANUFACTURER'S CONTROL DATA.
- 14. CONTRACTOR IS RESPONSIBLE TO ATTEND COORDINATION MEETING WITH ALL TRADES TO DETERMINE LOCATIONS OF DEVICES AND DISCOVER IF ANY CONFLICTS MAY EXIST.
- 15. ALL PIPING EXPOSED OR INSULATED, DUCTWORK, CONDUIT AND CONTROL WIRING SHALL BE CONCEALED IN CEILINGS, WALLS AND FLOORS OR CONCEALED IN NEW SOFFITS OR FRAMED ENCLOSURES.

#### HEATING DESIGN CRITERIA

- A. SITE (BASED ON NEAREST AVAILABLE DATA: ASHRAE 2017 HANDBOOK CLIMATIC DESIGN INFORMATION, WESTCHESTER CO, NY):
- 1. 41.07°N, 73.71°W 2. ELEVATION: 397 FT 3. CLIMATE ZONE 5A.
- OUTSIDE DESIGN CONDITIONS (BASED ON NEAREST AVAILABLE DATA: ASHRAE 2017 CLIMATIC DESIGN INFORMATION, WESTCHESTER CO, NY):

1. HEATING DB (99.6%): 9.2°F DB

INSIDE DESIGN CONDITIONS (PER NYSED MANUAL OF PLANNING STANDARDS S602-6 B. AND 2015 ASHRAE HANDBOOK CH 7 TABLE 6): 1. HEATING INDOOR SETPOINT: 72°F

#### GENERAL NOTES

- 1. THE CONTRACTOR SHALL VERIFIED THE EXISTING CONDITIONS AND COORDINATE THE WORK WITH OTHER TRADES..
- 2. THE FULL DEMOLITION SCOPE IS NOT SPECIFICALLY SHOWN ON THE DRAWINGS. PROVIDE DEMOLITION WORK CONSIDERED NECESSARY FOR THE COMPLETION OF THE WORK. SURVEY THE PREMISES TO ACCURATELY DETERMINE THE FULL SCOPE OF THE REMOVAL AND DISPOSAL WORK. NO ADDITIONAL PAYMENTS WILL BE MADE DUE TO CONTRACTOR'S FAILURE TO ADEQUATELY SURVEY THE PREMISES.
- 3. CONTRACTOR TO REMOVE AND PROPERLY DISPOSE OF EQUIPMENT FROM SITE INDICATED FOR DEMOLITION, UNLESS OTHERWISE DIRECTED BY THE AUTHORITY.
- 4. THE MECHANICAL CONTRACTOR SHALL PROVIDE POWER SUPPLIES, ELECTRICAL WIRING AND CONDUIT FOR POWER AND CONTROL TO PNEUMATIC DAMPER AND VALVE OPERATORS, THERMOSTATS, AUTOMATIC CONTROL INSTRUMENTATION, COORDINATE WITH THE ELECTRICAL CONTRACTOR TO PROVIDE A COMPLETE AND FUNCTIONAL SYSTEM.
- 5. FOR POWERED EQUIPMENT INTENDED FOR DEMOLITION, THE CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR TO REQUEST THAT POWER SUPPLIES AND DISCONNECT SWITCHES ASSOCIATED WITH THE EQUIPMENT ARE SHUT-OFF AND DISCONNECTED.
- 6. TEMPORARY SHUTDOWNS OF SERVICE OF EXISTING ELECTRICAL, STEAM, HEATING, AIR CONDITIONING AND VENTILATION SYSTEMS SHALL BE PERFORMED WITH A MINIMUM OF DISRUPTION OF SERVICE, HELD TO AN ABSOLUTE MINIMUM DURATION OF TIME. AND ONLY AFTER HAVING NOTIFIED THE BUILDING OPERATIONS MANAGEMENT AT LEAST TWO WEEKS IN ADVANCE AND HAVING RECEIVED THEIR PERMISSION IN WRITING. AT LEAST TWO WEEKS PRIOR TO THE SCHEDULED SHUTDOWN. COMMUNICATIONS SHALL BE RELAYED THROUGH THE PROJECT OFFICER.
- 7. PROVIDE MOTOR STARTERS AS REQUIRED FOR MECHANICAL EQUIPMENT.
- 8. CHIMNEY SHALL BE CLASSIFIED AS LOW TEMPERATURE, (DESIGN TEMPERATURE 300°F) AND SHALL COMPLY WITH NYSFGC AND NYSMC FOR HEIGHT OF CHIMNEY TERMINATION.
- 9. HEATING EQUIPMENT LOADS CALCULATIONS HAVE BEEN PERFORMED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS, SPECIFICALLY ASHRAE HANDBOOK
- 10. PERFORM COMMISSIONING OF THE HEATING SYSTEM IN ACCORDANCE WITH 2020 NYS
- 11. HEATING SYSTEM THERMOSTATIC CONTROLS SHALL BE TESTED FOR FUNCTIONALITY AND PROPER OPERATION AS REQUIRED BY 2020 NYS ECC..
- 12. ELECTRIC MOTORS SHALL COMPLY WITH THE REQUIREMENTS OF THE 2020 NYS ECC
- 13. PROVIDE EQUIPMENT MAINTENANCE MANUALS AND REQUIRED EQUIPMENT LABELS FOR ALL NEW MECHANICAL, ELECTRICAL AND SERVICE HOT WATER HEATING EQUIPMENT.
- 14. IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO PROVIDE CONTROL WIRING. THE MECHANICAL CONTRACTOR SHALL ALSO PROVIDE ALL POWER SUPPLIES, ELECTRICAL WIRING AND CONDUIT FOR POWER AND CONTROL TO ALL VALVE OPERATORS, THERMOSTATS AND AUTOMATIC CONTROL INSTRUMENTATION. ELECTRICAL CONTRACTOR TO INSTALL AND ROUTE POWER WIRING FOR EACH MECHANICAL SYSTEM.

#### **ABBREVIATIONS**

AD ACCESS DOOR DEMOLISH AFF ABOVE FINISHED FLOOR POINT OF CONNECTION BHP BRAKE HORSEPOWER BTUH BRITISH THERMAL UNIT PER HOUR POINT OF DISCONNECT CFM CUBIC FEET PER MINUTE CI CAST IRON SECTION A-A CO CLEAN OUT

### PIPING SYMBOLS

GENERAL SYMBOLS

| DEG<br>DIA, Ø    | DEGREE<br>DIAMETER  |            |                                  |
|------------------|---|------------|----------------------------------|
| EWT              | ENTERING WATER TEMPERATURE                                    | HWS        | HOT WATER SUPPLY                 |
| EX.              | EXISTING  | HWR        | HOT WATER RETURN                 |
| F<br>FD          | FAHRENHEIT<br>FLOOR DRAIN                                     | G          | NATURAL GAS                      |
| FT               | FEET  | ——— FOS——— | FUEL OIL SUPPLY                  |
| GA<br>GPM        | GAUGE<br>GALLONS PER MINUTE                                   | FOR        | FUEL OIL RETURN                  |
| HD               | HEAD  |            | DOMESTIC COLD WATER              |
| HOA              | HAND/OFF/AUTOMATIC  |            | DOMESTIC HOT WATER               |
| HP<br>HW         | HORSEPOWER<br>HOT WATER                                       |            | DOMESTIC HOT WATER RECIRCULATION |
| HWR<br>HWS<br>HZ | HEATING HOT WATER RETURN<br>HEATING HOT WATER SUPPLY<br>HERTZ |            | INDIRECT WASTE                   |
|                  |   |            |                                  |

## VALVE SYMBOLS

| 10              | HODE DIVINETER                                  |             |                    |
|-----------------|---|-------------|--------------------|
| IN WC<br>IN WG  | INCH WATER COLUMN<br>INCH WATER GAUGE           | <del></del> | ISOLATION VALVE    |
| KW<br>KWH       | KILOWATT<br>KILOWATT HOUR                       | <b>→</b>    |                    |
| LF<br>LWT       | LINEAR FOOT (FEET)<br>LEAVING WATER TEMPERATURE |             | CHECK VALVE        |
| M<br>MAX<br>MBH | METER MAXIMUM 1000 BTU/H                        |             | THREE-WAY, TWO-POS |

| MBH<br>MD<br>MHP<br>MIN | MAXIMOM  1000 BTU/H  MOTORIZED DAMPER  MOTOR HORSEPOWER  MINIMUM |               | SAFETY OR PRESSURE RELIEF VALVE  |
|-------------------------|--|---------------|----------------------------------|
| NA<br>NC<br>NO          | NOT APPLICABLE<br>NORMALLY CLOSED<br>NORMALLY OPEN               | <b>↑ ├</b> -1 | MANUAL AIR VENT                  |
| NOM<br>NTS              | NOMINAL<br>NOT TO SCALE  |               | TEST PLUG (PRESSURE/TEMPERATURE) |
| OD                      | OUTSIDE DIAMETER   | _             |                                  |

| NOT TO SCALE                      |  | TEST PLUG (PRESSURE/TEMPER   |
|-----------------------------------|--|--|
| OUTSIDE DIAMETER                  | П  |  |
| PRESSURE DROP                     | Щ  | THERMOMETER  |
| PRESSURE GAGE                     |  |  |
| POUNDS PER SQUARE INCH            |  | PIPE ANCHOR  |
| POUNDS PER SQUARE INCH - ABSOLUTE |  |  |
| POUNDS PER SQUARE INCH - GAGE     |  |  |
|                                   | NOT TO SCALE  OUTSIDE DIAMETER  PRESSURE DROP PRESSURE GAGE POUNDS PER SQUARE INCH POUNDS PER SQUARE INCH – ABSOLUTE | NOT TO SCALE  OUTSIDE DIAMETER  PRESSURE DROP PRESSURE GAGE POUNDS PER SQUARE INCH POUNDS PER SQUARE INCH - ABSOLUTE |

INLINE PUMP RPM REVOLUTIONS PER MINUTE STATIC PRESSURE

STAINLESS STEEL TESTING, ADJUSTING, BALANCE M TOTAL DYNAMIC HEAD

UON UNLESS OTHERWISE NOTED

COLD WATER (POTABLE)

DRY-BULB TEMPERATURE

DDC DIRECT DIGITAL CONTROLS

DECIBELS

ID INSIDE DIAMETER

VFD VARIABLE FREQUENCY DRIVE

W WASTE W/ WITH

WATER GAGE WPD WATER PRESSURE DROP

|   | CHECK VALVE                         |
|---|-------------------------------------|
| - | THREE-WAY, TWO-POSITION CONTROL VAL |
|   | SAFETY OR PRESSURE RELIEF VALVE     |
|   | MANUAL AIR VENT                     |
|   | TEST PLUG (PRESSURE/TEMPERATURE)    |

| $\uparrow  orall$ | MANUAL AIR VENT                  |
|--------------------|----------------------------------|
| ×<br>T             | TEST PLUG (PRESSURE/TEMPERATURE) |
|                    | THERMOMETER                      |
|                    | DIDE ANCHOR                      |

TEMPERATURE SENSOR/THERMOSTAT

MOTORIZED DAMPER

# AIR SEPARATOR SCHEDULE

FLOW

(GPM)

360

OPERATING

(LBS)

432

WEIGHT

BASIS OF DESIGN

MANUFACTURER

BELL & GOSSETT

MODEL #

CRS-5F

AIR SEPARATOR SCHEDULE NOTES:

SERVICE

UNIT #

PROVIDE A COALESCING REMOVAL AIR AND SEDIMENT SEPARATOR WITH A STAINLESS STEEL COALESCING MEDIUM AND REMOVABLE HEAD. PROVIDE CONNECTIONS FOR AN AIR VENT, SURFACE SKIM PORT, AND BOTTOM BLOWDOWN. INSTALL WITH CLEARANCES AS RECOMMENDED BY THE MANUFACTURER.

SIZE

(IN)

| INSULATION  | N SCHEDULE      |           |
|-------------|-----------------|-----------|
|             | NOMINAL PIPE DI | AMETER    |
| FLUID       | < 1 1/2"        | >= 1 1/2" |
| HOT WATER   | 1 1/2"          | 2"        |
| DOMESTIC CW | 1/2"            | 1"        |
|             |                 |           |

TYPE

HOT WATER | COALESCING AIR & DIRT

PIPE INSULATION SCHEDULE NOTES: PIPE INSULATION SHALL COMPLY WITH 2020 NYS ECC C403.11.3 2. INSULATION SHALL HAVE K=0.27 MINIMUM.

#### CAST IRON WATER TUBE GROSS I.B.R OUTPUT (BTU/H) 3,567,000 MIN. OVERALL BOILER EFFICIENCY (%) 3,102,000 NET I.B.R. OUTPUT (WATER) @ 100% (BTU/H) DESIGN HOT WATER SUPPLY TEMPERATURE (°F) 180 DESIGN HOT WATER RETURN TEMPERATURE (°F) MAX ALLOWABLE OPERATING PRESSURE (PSIG) 80 MIN. HEATING SURFACE, FIRESIDE (SQ. FT.) BOILER MANUFACTURER & MODEL NO. SMITH RTS/28HE-14 FLUE OUTLET SIZE (INCHES) SUPPLY OUTLET SIZE (INCHES) RETURN INLET SIZE (INCHES) BURNER MANUFACTURER & MODEL NO. POWERFLAME C3-G0-25 FUEL OIL FIRING RATE (GPH) 29.5

| DATA        | GAS FIRING    | RAIL (CFH)                          | 4293                  |
|-------------|---------------|-------------------------------------|-----------------------|
|             | INLET PRES    | SURE RANGE (IN WC)                  | 7.0 MIN/14.0 MAX      |
|             |               | COMBUSTION AIR BURNER MOTOR (HP)    | 2                     |
| ELECTRICAL  | DATA          | METERING PUMP MOTOR (HP)            | 1/2                   |
|             |               | ATOMIZING AIR COMPRESSOR MOTOR (HP) | N/A                   |
|             |               | VOLT. PH. HZ.                       | 208/3/60              |
|             |               | COMBUSTION CONTROL                  | 120/1/60 (SEE NOTE 5) |
|             |               | OPERATING AMPS                      | N/A                   |
| OVERALL DIN | MENSIONS OVER | CONTROLS (L X W X H) (INCHES)       | 162x42x66             |
| HOUSE KEEF  | PING CONCRETE | PAD DIMENSIONS (INCHES)             | 126x54                |

BOILER-BURNER UNIT SCHEDULE

BOILER #1

#2 FUEL OIL

BASEMENT, BOILER ROOM

OPERATING WEIGHT LBS. BOILER-BURNER UNIT SCHEDULE NOTES: 1. VERIFY IN FIELD CONNECTION LOCATIONS AND CLEARANCES FOR BOILERS, ESPECIALLY HEIGHT AND TUBE

FUEL TYPE

LOCATION

- PULL CLEARANCE. REFER TO MANUFACTURER'S DOCUMENTS. 2. SHIP EQUIPMENT SPECIFIED HEREIN KNOCKED DOWN AS NECESSARY FOR DELIVERY AND INSTALLATION. VERIFY ALL DIMENSIONS IN THE FIELD AND WITH EQUIPMENT MANUFACTURERS.
- 3. PROVIDE CONTROL PANEL, LEAD-LAG PANEL, WIRING, AND OTHER EQUIPMENT AS NECESSARY TO SATISFY THE SEQUENCE OF OPERATIONS.
- 4. PROVIDE (2) LOW WATER CUTOFF VALVES. 5. BURNER COMBUSTION CONTROL CIRCUIT SHALL BE POWERED FROM A SEPARATE 120V SINGLE PHASE GROUNDED CIRCUIT.



|     |  |  |  | 11-10-20 BIDDING DOCUMENTS |   |
|-----|--|--|--|----------------------------|---|
|     |  |  |  | 11-10-20                   | - |
|     |  |  |  | _                          | - |
| 1 - |  |  |  |                            |   |

| PC | Checked by | SCY | Project No. | 390626 | Scale | AS NOTED | Date |
|----|------------|-----|-------------|--------|-------|----------|------|
| (  |            |     |             |        |       |          |      |

|  | Mechanical<br>& Electrical<br>Engineer: | GREENMAN<br>PEDERSEN, INC<br>400 rella boulevard<br>Montebello, ny 10901 |
|--|---|--|
|  | Structural<br>Engineer:                 |  |

REPLACEMENT
AT NEARY
NTARY SCHOOL BOILER J AT ELEMEN



